REMARKS

The Office Action of November 10, 2004 has been reviewed and the Examiner's comments carefully considered. The present Amendment amends claims 1, 2, 4 and 6-8 and adds new claims 11-22, all in accordance with the originally-filed specification. Support for these amendments and additions can be found, for example, on page 6, lines 6-11 and 28-31; page 6, line 36 to page 7, line 17; and Fig. 2 of the originally-filed specification. Accordingly, no new matter has been added in this Amendment. Claims 1-22 are pending in this application, and claims 1, 4 and 13 are in independent form.

Initially, the Examiner has objected to claims 3 and 7 under 37 C.F.R. § 1.75(c), as being of improper dependent form for failing to further limit the subject matter of the previous claim. In particular, the Examiner has objected to these claims as mentioning that the polyurethane is made without the addition of any solvents, which was a limitation already present in the independent claim from which they depend. Through the foregoing amendment, both independent claims 1 and 4 have been amended, such that this objection is moot. In addition, the amendment to claims 1 and 4 are such that dependent claims 3 and 7 do indeed further limit the claims from which they depend. Therefore, withdrawal of these objections is respectfully requested.

Claims 1, 3, 4 and 7-10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,167,352 to Robbins. Claims 2 and 6 stand rejected under 35 U.S.C. § 103(a) as being obvious over the Robbins patent in view of the previously-cited Bartelloni patent. Further, claim 5 stands rejected under 35 U.S.C. § 103(a) as being obvious over the Robbins patent in view of the previously-cited Mitchell patent. In view of the foregoing amendments and the following remarks, Applicant respectfully requests reconsideration of these rejections.

Independent claim 1 of the present application, as amended, is directed to an underground reservoir for storing liquid products. This reservoir consists of an inner, main reservoir and an outer, secondary reservoir. Further, the outer, secondary reservoir consists of a coating layer, which consists of an inner layer made from an impervious material and an outer layer made from polyurethane. In addition, a gap for receiving a sensor is defined between the inner reservoir and the outer reservoir.

Independent claim 4 of the present application, as amended, is directed to a process for manufacturing an underground reservoir. This method includes the steps of: providing an inner, main reservoir; and covering an outer surface of the main reservoir with a first coating layer consisting of an impervious material, and applying a second coating layer consisting of polyurethane over the first coating layer, thereby forming an outer, secondary reservoir. Again, a gap for receiving a sensor is defined between the inner reservoir and the outer reservoir.

New independent claim 13 of the present application is directed to a process for manufacturing an underground reservoir. This process includes the steps of: providing an inner, main reservoir; covering the inner reservoir with an impervious material, in the form of a first coating layer; and applying a polyurethane layer, in the form of a second coating layer, over the impervious material. This application occurs in an airless process. In addition, the process forms a two-component outer, secondary reservoir.

The Robbins patent is directed to a double wall tank system. In particular, the system of the Robbins patent is directed to a double wall tank for the underground storage of fluids. The tank or underground reservoir of the Robbins patent is directed to a double-walled reservoir having an inner, main tank made of steel and an outer, secondary containment tank made of plastic resin. As best seen in Figs. 12 and 13 of the Robbins

patent, the outer, secondary containment tank may be made with or without a reinforcement material. Importantly, the tank includes an intermediate barrier layer made from any number of porous materials.

The Robbins patent discloses an outer, secondary containment tank, and an inner, main containment tank, which are located immediately adjacent an intermediate layer, specifically the intermediate porous barrier layer 18c, which is composed of one-sided corrugated sheet material 74, such as one-sided corrugated cardboard. As seen in Figs. 14 and 15, the one-sided corrugated sheet material 74 may include a single flat supporting lamination 76, which has an exposed flat side 78 and a covered side 80, to which the corrugated lamination 82 is bonded. The corrugated lamination 82 has an exposed side 84, which consists of alternating, parallel ridges 86 and grooves 88, and the sheet material 74 is made over the entirely outer surface of the inner tank shell 12, with the exposed corrugated side 84 facing the tank shell 12. Further, a fiber-reinforced resin material is then applied over the exposed flat side 78 of the supporting lamination 76, and the outer layer of resin may be formed with or without the fiber-reinforcement layer and may be made from a polyurethane. See column 16, lines 44-66 of the Robbins patent.

The Bartelloni patent is directed to latex-containing papers, and it appears that the Examiner continues to use the Bartelloni patent for its teaching of specialty paper applications, such as the use of latex papers as liquid-resistant papers for use in manufacturing coated papers and boards. Accordingly, it appears that the Examiner believes that the Bartelloni patent teaches that latex papers can be used in tank construction, asserting that the polymeric materials added as latex confer on the paper impermeability, flexibility and resistance. In addition, the Examiner continues to use the Mitchell patent for its teaching of

the common surface preparation technique of abrasive blasting of the steel, also asserting that this is a well-known technique in the art.

The double wall tank system of the Robbins patent remains wholly distinguishable from the underground reservoir and process for manufacturing such a reservoir according to the present invention. Applicant again submits that the Robbins patent teaches a construction of a double walled reservoir wherein any possible leakage from the inner, main tank made of steel, which is more susceptible to corrosion, is partially absorbed and directed by the intermediate porous barrier layer 18c to the bottom part of the double-walled reservoir, between the inner and outer tanks, thereby preventing it from reaching and causing any damage to the environment. Accordingly, the outer, secondary containment tank is a prior art structure that is described in Standard UL 1746, Part III, pages 17.4, dated November 28, 1989.

The Robbins patent does not teach an inner, main reservoir as one structure, and an outer, secondary reservoir as a two-component coating layer, which forms a structurally independent secondary reservoir, as specifically taught in the present application. Instead, the Robbins patent is focused specifically on the intermediate porous barrier layer positioned around the inner, main tank and how it can better direct any fluid leaking therefrom to the bottom part of the double-walled reservoir, between the inner and outer tanks. As best seen in Figs. 1 and 3, the intermediate porous barrier layer 18 is an open-cell or open-communication material that allows the free flow of both liquid and gas through its entire extent. Further, the Robbins patent specifically defines the intermediate porous barrier layer 18 as being "a layer of solid material which has continuously communicating interstitial spaces," and the disclosure of the Robbins patent clearly recites open-cell polyurethane or

open-cell high density polyurethane as suitable materials for the intermediate porous barrier layer.

Further, the Robbins patent teaches that the open-cell porous material can be substituted by other materials, such as channel-mesh, one-sided corrugated cardboard and other similar materials. See Figs. 8, 9, 12 and 14. Therefore, the Robbins patent is focused on the manufacture of interstitials of different materials to improve the speed of flow of any fluid leaking from the inner tank to the bottom of the reservoir. The Examiner maintains that the "fact that Robbins teaches the corrugated cardboard layer as an intermediate layer instead of an inner layer of the secondary reservoir does not change the fact that both Robbins and the claimed invention is an underground reservoir consisting of three layers." Applicant continues to disagree, and it appears that the Examiner is disregarding structural limitations in the underground reservoir of the present invention. In the Robbins patent, the corrugated cardboard is not the inner layer of the external coating, but is in fact an intermediate porous barrier layer separating the inner, main tank and the outer, secondary tank. Since the corrugated paper cited by Robbins is an intermediate porous barrier layer, and defines a physical interstice between the inner tank and the outer tank that facilitates the passage of any liquid leaking from the inner tank, the Robbins patent does not teach or suggest the underground reservoir of the present invention.

With respect to the underground reservoir of the present invention, the impervious material is part of the two-component outer tank, and this material is used only to prevent the polyurethane from adhering to the inner tank. It is further submitted that a three-layer double walled tank, wherein each of the layers is in contact with at least one other layer, is different than the underground reservoir of the present invention. Again, the presently-

invented tank includes an inner, main reservoir, and a separate outer, secondary reservoir, which is a two-component coating layer.

With specific reference to the independent claims of the present application, both independent claims 1 and 4 have been amended to recite a gap for receiving a sensor being defined between the inner reservoir and the outer reservoir. This gap is best illustrated in Fig. 2 of the present application, as originally filed. Further, the existence of such a gap illustrates the positive separation between the inner, main reservoir and the outer, secondary reservoir. It is this gap that receives the sensor, such that if the inner, main reservoir were leaking, the liquid would flow through the gap and reach the sensor, which would provide an alarm to alert a user about a leak. The Robbins patent does not have such a gap, and instead uses the intermediate porous barrier layer 18 to allow flow of a liquid therethrough. Accordingly, the Robbins patent focuses on the porous material and how it can better direct any fluid to the bottom of the reservoir. The present invention uses the gap and the capillary ability of this evacuated gap or space as an interstitial layer. In fact, the Robbins patent describes a four-component system, including the inner tank, the corrugated lamination, the support lamination and the outer coating. The present invention specifically teaches a three-component system, where the inner, main tank is one component, and the outer, secondary tank consists of two layers, an impervious material and an outer layer of polyurethane is the other component. Also, as discussed above, there is a gap or evacuated space in between the inner reservoir and the outer reservoir of the tank defined in the present application.

A comparison between Fig. 2 of the present application and Figs. 3, 4, 9, 10 and 11 of the Robbins patent clearly demonstrates that there are clear structural differences between the underground reservoir of the present invention and the double walled tank

system of the Robbins patent. These structural differences cannot be ignored when comparing the inventions in the present application and in the Robbins patent.

Still further, the intermediate porous barrier layer 18c of the tank of the Robbins patent is expressly not impervious. In particular, the intermediate porous barrier layer 18c of the Robbins patent is a layer of solid material having continuously-communicating interstitial spaces, and this material may be open-cell polyurethane, open-cell high density polyurethane, corrugated cardboard or other similar porous materials. In general, the Robbins patent teaches two main embodiments, namely a three-component system, which could be referred to as a "sandwiched tank", having an intermediate porous barrier layer 18c sandwiched between an inner tank shell 12 and an outer tank shell 24. See column 13, lines 25-29 of the Robbins patent. Another embodiment could be referred to as a four-component system. This tank construction of the Robbins patent includes: (1) an inner tank shell 12; (2) an intermediate porous barrier layer 18c; (3) a support lamination; and (4) an outer tank shell 24.

In both of these embodiments, the Robbins patent requires the use of the intermediate porous barrier layer 18c, as described above. This porous layer has several drawbacks. For example, when the corrugated cardboard is used as the intermediate porous barrier layer 18c, this material will first absorb a large amount of any fuel leaking from the inner steel tank before it reaches the bottom of porous barrier layer, where it can be detected by the sensor 44. This condition results from the physical characteristics of corrugated cardboard, and this absorption will cause a delay in the detection of any leakage. Yet another drawback to the tank system of the Robbins patent results from the typical use of such underground reservoirs in the art. In particular, such tanks are normally used for storing fuels, which are corrosive. Accordingly, the use of open-cell polyurethane and open-cell high

density polyurethane as the intermediate porous barrier layer 18c would prove useless, as both materials would absorb the fuel and exhibit signs of corrosion before letting the fuel run to the bottom of the porous barrier layer. Still further, over time, these types of polyurethanes would disintegrate in such an environment.

In the present invention, and as set forth in the claims, the inner layer of the outer, secondary reservoir is an impervious material. The use of this impervious material (in combination with the polyurethane layer) avoids any absorption of the leaking fuel or liquid, which instead runs freely through the above-discussed gap or evacuated space in between the inner, main reservoir and the outer, secondary reservoir. Therefore, this fuel or leakage is sensed by the tank system of the present invention much more quickly, such that the user may, in turn, respond as quickly as possible. This is yet another advantage, particularly an environmental benefit, to the underground reservoir of the present invention.

Therefore, none of the Robbins patent nor any of the prior art of record, whether used alone or in combination, teach an underground reservoir consisting of an inner reservoir and an outer reservoir consisting of a coating layer of an inner layer made from an impervious material and an outer layer made of polyurethane, where a gap for receiving a sensor is defined between the inner and outer reservoirs, as specifically set forth in independent claim 1, as amended.

Further, none of the Robbins patent nor any of the prior art of record, whether used alone or in combination, teaches a process for manufacturing an underground reservoir with an inner reservoir and a coating layer consisting of an impervious material and polyurethane, where a gap for receiving a sensor is defined between the inner reservoir and the outer reservoir, as specifically set forth in independent claim 4 of the present application, as amended.

As a matter of note, Applicant respectfully draws the Examiner's attention to Australian Patent No. 776076, which issued on an Australian application corresponding to the present U.S. patent application. A copy of this Australian patent is enclosed for the Examiner's reference. The Australian Examiner also cited the Robbins patent during prosecution of the Australian patent application, and the claims were amended to include the gap for receiving a sensor defined between the inner reservoir and the outer reservoir. On this basis, the Australian Examiner granted the patent. Applicant submits that this further indicates the distinguishable structural limitations of the present invention in view of the prior art of record, including the Robbins patent.

For the foregoing reasons, independent claims 1 and 4 are not anticipated by or rendered obvious over the Robbins patent, the Bartelloni patent, the Mitchell patent or any of the prior art of record, whether used alone or in combination. There is no hint or suggestion in any of the references cited by the Examiner to combine these references in a manner which would render the invention, as claimed, obvious. Reconsideration of the rejection of independent claims 1 and 4 is respectfully requested.

Claims 2, 3, 9 and 11 depend directly or indirectly from and add further limitations to independent claim 1 and are believed to be allowable for the reasons discussed hereinabove in connection with independent claim 1. Further, claims 5-8, 10 and 12 depend directly or indirectly from and add further limitations to independent claim 4 and are believed to be allowable for the reasons discussed hereinabove in connection with independent claim 4. Therefore, for all the above reasons, reconsideration of the rejections of claims 2, 3 and 5-10 is respectfully requested.

With respect to independent claim 13, this claim has additional reasons for patentability. In particular, after being coated with the impervious material, the tank is

conveyed to a painting station. The outer polyurethane layer 7 is applied through an airless process, and this process forms the two-component outer, secondary reservoir. It should be noted that the Robbins patent applies a polyurethane paint or resin in a paint booth. The process of the present invention does not describe a painting process, but instead a two-component polyurethane application process, which requires specialized polyurethane two-component spray application equipment. The physical benefits of the underground reservoir of the present invention is only possible with this two-component outer tank of an impervious separator material bonded to structural bi-composition polyurethane. This two-component outer, secondary reservoir is only possible by applying a structural polyurethane in this process, and the presently-invented process and resulting characteristics of the outer, secondary reservoir clearly demonstrate that it is not a polyurethane paint or resin, as is specifically used in the Robbins patent.

The polyurethane coating layer, which is applied over the impervious material in an airless process, forms the two-component outer, secondary reservoir, which results in an underground reservoir having unexpected results and satisfies a long-felt need in the industry. The gap-style leak detection system of the present invention, which includes three layers or components, separated by the gap, display system characteristics that are required for underground storage tanks in compliance with the various regulations for such tanks. For example, the application and use of this polyurethane provides an electrically insulating non-metallic two-component material. This prevents the possibility of forming a galvanic couple that could speed up the corrosion of the inner, main reservoir.

Further, this two-component outer reservoir, and specifically the structural polyurethane coating layer, allows the tank to be impact resistant. Accordingly, the polyurethane coating provides a high strength to impact, which can easily be repaired when

damages are caused to the tank during the handling, transportation or installation from the reservoir and which presents excellent electric insulation characteristics. Such characteristics are important to reservoirs designed for storing flammable products.

Applicant continues to maintain that in 1989, when the application underlying the Robbins patent was filed, the forming of an outer tank shell made of such structural polyurethane, without the addition of any solvents, was simply impossible. This solventless, structural polyurethane provides an extremely clean and non-toxic process, as it does not use toxic materials or agents. In addition, the process is simpler and faster, has less operating steps, and uses less raw materials than the prior art of record. Still further, the second coating layer of polyurethane may have a desired minimum thickness of at least 2.5 mm. Importantly, such a thickness would not be obtainable using prior art polyurethane resins and paints, such as those disclosed and used in the Robbins patent and the remaining art of record. It is this thick, structural polyurethane that provides the novel insulating and impact-resistance characteristics, while still meeting and complying with the standards in the industry.

Therefore, none of the Robbins patent nor any of the prior art of record discloses a process for manufacturing an underground reservoir, where a polyurethane layer is applied over an impervious material in an airless process, thereby forming a two-component outer, secondary reservoir, having the unique characteristics as disclosed and as set forth in independent claim 13 of the present application. For these reasons, independent claim 13 is not anticipated by or rendered obvious over the Robbins patent, the Bartelloni patent, the Mitchell patent nor any of the prior art of record, whether used alone or in combination. There is no hint or suggestion in any of the references cited by the Examiner to

combine these references in a manner which would render the invention, as claimed, obvious. Allowance of independent claim 13 is respectfully requested.

Claims 14-22 depend either directly or indirectly from and add further limitations to independent claim 13 and are believed to be allowable for the reasons discussed hereinabove in connection with independent claim 13. Therefore, for all the above reasons, allowance of claims 14-22 is respectfully requested.

For all the foregoing reasons, Applicant believes that claims 1-22, as amended and added, are patentable over the cited prior art and are in condition for allowance. Reconsideration of the rejections and allowance of all pending claims 1-22 are respectfully requested.

Respectfully submitted,

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